

Claims

- [c1] 1. A sensor housing for measuring light transmission across a tissue of a patient, comprising:
- a unitarily constructed top member and bottom member joined at a crease point;
 - the top and bottom members being foldable towards each other at the crease point to, in turn, create an enclosure therebetween;
 - the top member having a first and a second aperture therein; and
 - the top and bottom members comprising a flexible material such that, when placed in operative position on the tissue of a patient, the sensor housing may be flexed so that the first and second apertures are in substantial optical alignment.
- [c2] 2. The sensor housing of Claim 1, wherein the top and bottom members are constructed of a material comprising one or more of an opaque material, a low Shore hardness material, a material that will limit slippage adjacent a patient's tissue, and a malleable material that conforms to the shape of a patient's tissue.
- [c3] 3. The sensor housing of Claim 1, additionally compris–

ing means for sealing the enclosure against intrusion of one or more of foreign bodies, moisture and ambient light.

- [c4] 4. The sensor housing of Claim 3, wherein the sealing means comprises a seal surrounding a periphery of the enclosure, the seal comprising one or more of an adhesive seal, an ultrasonic seal, and a welded seal.
- [c5] 5. The sensor housing of Claim 1, wherein the enclosure comprises an emitter housing, a detector housing and a wiring conduit therebetween.
- [c6] 6. The sensor housing of Claim 5, wherein the emitter housing encloses an emitter therein, and the detector housing encloses a detector therein, wherein the emitter and detector are electrically connected through an electrical connection means through the wiring conduit.
- [c7] 7. The sensor housing of Claim 6, wherein the enclosure has a top portion adjacent the top member and a bottom portion adjacent the bottom member, and a thickness therebetween, the sensor housing having at least one of the emitter being placed proximate the top portion of the enclosure, and the detector being placed proximate the bottom portion of the enclosure.
- [c8] 8. The sensor housing of Claim 6, wherein the detector

comprises a rear side, and has a coating of conductive material on the rear side of the detector.

[c9] 9. The sensor housing of Claim 8, wherein the conductive material comprises copper.

[c10] 10. The sensor housing of Claim 1, wherein the top member includes a top surface, wherein the top surface comprises a raised portion that approximates the curvature of a patient's tissue.

[c11] 11. A trans-illumination device comprising:
-a sensor housing as described in Claim 1;
-a backing substrate to which the sensor housing is affixed;
-means for affixing the sensor housing to the backing substrate; and
-means for attaching the trans-illumination device to a patient.

[c12] 12. The device of Claim 11, wherein the affixing means comprising a flexible strap having at least one aperture, and the sensor housing including an emitter head and a detector head configured to be inserted into the at least one aperture, and the flexible strap overlays and is attached to the sensor housing and the backing substrate to, in turn, affix the sensor housing to the backing sub-

strate.

- [c13] 13. The device of Claim 12, wherein the attaching means comprises an adhesive associated with one or more of the flexible strap, the sensor housing, and the backing substrate.
- [c14] 14. The device of Claim 12, wherein the attaching means comprises a Velcro® strap associated with the flexible strap.
- [c15] 15. The device of claim 12, wherein at least one of the emitter head and detector head comprises a flexible flange, wherein the flange facilitates attachment to the flexible strap.
- [c16] 16. The device of Claim 12, wherein at least one of the emitter head and detector head extends above a top side of the flexible strap.
- [c17] 17. The device of Claim 11, further comprising a wiring device electrically connected to the sensor housing, wherein the affixing means comprises at least one bracket overlaying one or more of the sensor housing and the wiring device, and attached to the backing substrate.
- [c18] 18. The device of Claim 17, wherein the attaching means

comprises an adhesive associated with one or more of the bracket, the sensor housing, and the backing substrate.

[c19] 19. The device of Claim 17, wherein the attaching means comprises a Velcro® strap associated with the backing substrate.

[c20] 20. The device of Claim 17, wherein the sensor housing extends above a top side of the bracket.

[c21] 21. The device of Claim 17, wherein the bracket comprises means for aligning a finger of a patient with the trans-illuminating device.

[c22] 22. A method of manufacturing a sensor housing for a transillumination device, comprising the steps of:

- molding a top member and a bottom member from a unitary piece of material, wherein the top and bottom members include a crease point, and the top member includes a first and a second aperture;
- inserting an emitter and a detector into at least one of the top and bottom members so that they are in substantial optical alignment with the first and second aperture respectively;
- connecting the emitter and detector together with an electrical connection;

- securing the emitter and detector in the at least one top and bottom member; and
- folding the top and bottom members at the crease point to, in turn, form an enclosure therebetween.

[c23] 23. The method according to Claim 22, further including the step of sealing the enclosure around a periphery of the top and bottom members.

[c24] 24. The method according to Claim 23, wherein the step of sealing comprises at least one of the steps of ultra-sonic sealing, applying an adhesive seal, and heat sealing.

[c25] 25. A method for remanufacturing an otherwise disposable transillumination device, the method comprising the steps of:

- acquiring an otherwise disposable device, the device comprising a sealed sensor housing according to Claim 1, connected to a wiring device, and a means for attaching the sensor housing to a patient;
- removing the attaching means from the disposable device;
- sanitizing or sterilizing the sealed sensor housing and the wiring device; and
- reassociating the sealed sensor housing with a new attaching means to, in turn, facilitate the use of the

device on a patient

26. The method according to Claim 25, wherein the attaching means comprises a backing substrate to which the sensor housing is affixed, and a flexible strap overlaying and affixed to the sensor housing and the backing substrate.

[c26] 27. The method according to Claim 25, wherein the attaching means comprises a backing substrate to which the sensor housing is affixed, and at least one bracket overlaying and affixed to at least one of the sensor housing and the wiring device and the backing substrate.

[c27] 28. A method of decreasing the cost of an otherwise disposable medical unit, comprising the steps of:

- acquiring an otherwise disposable medical device, wherein the medical device includes a sensor housing according to Claim 1, a backing substrate to which the sensor housing is affixed, means for affixing the sensor housing to the backing substrate; and means for attaching the trans-illumination device to a patient;

- removing the sensor housing, and disposing of the remainder of the medical device;

- sanitizing or sterilizing the sensor housing; and

- reinserting the sensor housing into a new otherwise disposable medical device to, in turn, reduce overall

costs for remanufacturing the device.